

**REMARKS**

Claims 1-5 and 8-13 are pending after entry of this paper. Claims 1-5 and 8-13 have been rejected. Claims 6-7 have been cancelled without prejudice. The applicant reserves the right to pursue the cancelled claims in a divisional or continuing application.

Claims 1, 2, 5, and 12 have been amended. Support for the amendment to Claim 1 may be found throughout the instant specification, for example, at page 3, lines 15-18 and, at page 4, lines 24-26. Claims 2, 5, and 12 have been amended to correct grammatical and typographical errors thereby placing the claims in proper claim format.

No new matter has been introduced by these amendments. Reconsideration and withdrawal of the pending rejections in view of the above claim amendments and below remarks are respectfully requested.

The applicant wishes to thank the Examiner for taking the time to review and consider proposed claim amendments with respect to claim 1 and the 103(a) rejection thereto.

**Response to Rejections under 35 U.S.C. §103**

Claim 1 has been rejected under 35 U.S.C. § 103(a) as being unpatentable over Kieswetter, Jr. et al. (U.S. PN 3,951,649; hereafter, the “‘649 patent”) in view of Partridge (U.S. PN 6,165,367; hereafter, the “‘367 patent”).

The applicant respectfully disagrees with the Examiner’s contention that Claim 1 of the instant invention is rendered obvious over the ‘649 patent in view of the ‘367 patent. Specifically, the Examiner contends that it would have been obvious to one of ordinary skill in the art to substitute a suitable ion-exchange resin as demonstrated in the ‘367 patent into the process of the ‘649 patent. (Non-final office action, July 10, 2007, page 4). As the Examiner is

well aware, the relevant inquiry is whether the prior art suggests the invention, and whether one of ordinary skill in the art would have had a reasonable expectation that the claimed invention would be successful. *In re O'Farrell*, 853 F.2d 894, 902-4 (Fed. Cir. 1988); *In re Vaeck*, 947 F.2d 488, 20 U.S.P.Q.2d 1438 (Fed. Cir. 1991). Both the suggestion of the claimed invention and the expectation of success must be in the prior art, not in the disclosure of the claimed invention. *In re Dow Chemical Co.*, 5 U.S.P.Q.2d 1529 (Fed. Cir. 1988).

The '649 patent discloses a process for recovering copper metal from an aqueous chloride solution consisting of monovalent copper ions and other metal ion impurities. To separate the copper ions from the metal ion impurities in the chloride solution, the process of the '649 patent extracts the copper ions by contacting the aqueous solution with an organic liquid solution that contains an organic ion-exchange compound capable of selectively combining with the copper ions. This liquid-liquid extraction results in an organic solution containing copper ions and an aqueous chloride solution that contains the metal ion impurities.

The '367 patent teaches a method for removing heavy metal ions from an aqueous waste stream by contacting the waste stream with a chelating ion-exchange resin that contains amino-phosphonic functional groups which capture the heavy metal ions.

As disclosed in Claim 1, the instant invention claims a method for removing metal ion impurities from a strong chloride solution of monovalent copper by using a chelating ion-exchange resin. This ion-exchange resin selectively captures and removes the metal ion impurities from the aqueous chloride solution. The monovalent copper ions remain in the aqueous chloride solution.

Neither the '649 patent nor the '367 patent suggests the method of the claimed invention. Although the process of the '649 patent involves the separation of monovalent copper

ions from metal ion impurities present in a chloride solution, the separation method employed by the '649 patent fundamentally differs from the method of the present invention. Unlike the present invention, which separates the copper ions from the metal ion impurities by removing the metal ion impurities from the chloride solution and leaving the copper ions in the chloride solution, the '649 patent accomplishes this separation by extracting the copper ions from the chloride solution into an organic solution and leaving the metal ion impurities in the chloride solution (col.3, lines 50-60). Given these fundamentally different separation methods, the process of the '649 patent would not suggest to a person of ordinary skill in the art the efficacy of substituting the ion-exchange resin of the '367 patent into the process of the '649 patent as this substitution would result in a situation in which the separated copper ions resided in an aqueous chloride phase rather than the organic phase of the '649 patent.

Similarly, although the '367 patent discloses the use of chelating ion-exchange resins to remove heavy metal ions from an aqueous waste stream, the '367 patent does not suggest the successful use of these resins to remove metal ion impurities from a strong chloride solution that contains monovalent copper ions. The specification and claims of the '367 patent focus exclusively on the ability of the chelating ion-exchange resins to remove heavy metal ions, especially uranium, from an aqueous waste stream (col. 2, lines 14-21). The '367 patent does not suggest or teach that chelating ion-exchange resins are incapable of capturing certain types of metal ions, especially monovalent copper ions, which is a necessary feature that enables the claimed method of the instant invention. Based on the teachings of the '367 patent, one of ordinary skill in the art would have no expectation that chelating ion-exchange resins could be used to remove metal ion impurities, but not monovalent copper ions.

However, in order to expedite prosecution and without disclaimer of or prejudice to the subject matter recited therein, the applicant has amended Claim 1 by incorporating the subject matter of Claims 6-7. This amendment introduces no new subject matter, and support for the amendment to Claim 1 may be found throughout the instant specification, for example, at page 3, lines 15-18. This amendment further distinguishes the claimed invention from the prior art because the '367 patent only teaches the use of ion-exchange resins in aqueous conditions that lack the presence of monovalent copper ions. In contrast the present invention requires a chloride solution with a monovalent copper content of 30 - 100 g/l. Consequently, given the teachings of the '367 patent, one of ordinary skill in the art would have no expectation that chelating ion-exchange resins could be used to successfully remove metal ion impurities from a chloride solution of monovalent copper ions.

Because neither the '649 patent nor the '367 patent suggests the successful use of chelating ion-exchange resins to remove metal ion impurities from an aqueous chloride stream containing copper ions, applicant respectfully asserts that Claim 1 of the instant invention is not rendered obvious over the '649 patent in view of the '367 patent. The '649 patent does not disclose a method of purifying a copper chloride solution using a chelating ion-exchange resin and the '367 patent does not remedy the deficiencies of the '649 patent. Therefore, applicant respectfully requests consideration and withdrawal of the § 103(a) rejection of Claim 1.

Claims 2-5 and 13 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the '649 patent in view of the '367 patent. Claims 2-5 and 13 each depend on Claim 1 which has been shown to be nonobvious over these prior art citations. Therefore, Claims 2-5 and 13 also are nonobvious over the '649 patent in view of the '367 patent. The applicant

respectfully requests reconsideration and withdrawal of the § 103(a) rejection of Claims 2-5 and 13.

Claims 8 and 9 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the '649 patent in view of the '367 patent, and in further view of Everett (U.S. PN 5,487,819; hereafter, the "819 patent"). Everett discloses a method for recovering copper metal from a chloride milieu that involves raising the pH of an electrolyte solution from "a level below 3.5 . . . to a level up to a pH of 6 to 6.5" so as to precipitate the metal ion salts in the chloride solution but not the copper ions (col. 12, lines 30-45). In this separation step the pH is not raised above 6.5 because in strong chloride solutions monovalent copper ions remain stable in solution up to a pH of approximately 6.5 to 6.7 (col. 12, lines 35-37). Despite the teaching of the '819 patent regarding the maximum pH level of a strong chloride solution that contains monovalent copper ions, it would not be obvious to one of ordinary skill in the art to combine the '649 patent, the '367 patent, and the '819 patent given that the '649 patent teaches the extraction of copper ions into an organic phase, the '367 only discloses the use of chelating ion-exchange resins in an alkaline, copper-free environment, and the '819 patent involves the manipulation of pH levels to precipitate metal impurities from a chloride solution. Therefore, the applicant respectfully requests reconsideration and withdrawal of the § 103(a) rejection of Claims 8 and 9.

Claims 10-11 and 13 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the '649 patent in view of the '367 patent, and in further view of Hyvarinen et al. (U.S. PN 6,007,600; hereafter, the "600 patent"). The '600 patent discloses a process for the recovery of copper from a chloride solution that uses solution purification to remove metal impurities from the chloride solution. The '600 patent, however, neither suggests nor teaches the use of a chelating ion-exchange resin to accomplish any portion of the purification of the copper

chloride solution. Since the '367 patent and the '600 patent do not remedy the deficiencies of the '649 patent, the combination of these cited references does not result in the claimed invention. Because Claims 10-11 and 13 depend on Claim 1, which has been shown to be nonobvious over the '649 patent in view of the '367 patent, Claims 10-11 and 13 also are nonobvious despite the citation of the '600 patent. The applicant respectfully requests reconsideration and withdrawal of the § 103(a) rejection of Claims 10-11 and 13.

Claims 6-7 and 12 have been rejected under 35 U.S.C. § 103(a) as being unpatentable over the '649 patent in view of the '367 patent, and in further view of the '600 patent and Cupertino et al. (U.S. Re 36,118: hereafter, the "118 reissue patent). Cupertino discloses a method for the recovery of a metal ion from an organic complex into an aqueous solution. However, because Cupertino in combination with the other cited references does not result in the claimed invention, the combination does not make obvious the claimed invention. Cupertino does not remedy the deficiencies of the '649 patent, the '367 patent, and the '600 patent. Because Claims 6-7 depend on Claim 1, which has been shown to be nonobvious over '649 in view of '367, Claims 6-7 also are nonobvious despite the citation of the '600 and '118 references. With regard to Claim 12 which depends on Claim 11, Claim 11 already has been shown to be nonobvious as it depends on Claim 1. Therefore, the additional '600 and '118 references do not render Claim 12 obvious. The applicant respectfully requests reconsideration and withdrawal of the § 103(a) rejection of Claims 6-7 and 12.

**CONCLUSION**

Based on the foregoing amendments and remarks, applicant respectfully requests reconsideration and withdrawal of the rejection of claims and allowance of this application. Favorable action by the Examiner is earnestly solicited.

**AUTHORIZATION**

The Commissioner is hereby authorized to charge any additional fees which may be required for consideration of this Amendment to Deposit Account No. **13-4500**, Order No. 4819-4721.

In the event that an extension of time is required, or which may be required in addition to that requested in a petition for an extension of time, the Commissioner is requested to grant a petition for that extension of time which is required to make this response timely and is hereby authorized to charge any fee for such an extension of time or credit any overpayment for an extension of time to Deposit Account No. **13-4500**, Order No. 4819-4721.

Respectfully submitted,  
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